100 females (mean age 64 ± 4 yr.) and Group 2: 100 males (60 ± 6 years) referred to our Coronary Care Unit for a first episode of typical chest pain. Stress Thallium Scintigraphy (STS) was performed in 18 females and in 17 males; dobutamine stress-echo (DSE) in 42 females and in 40 males and an exercise test (ET) in 48 females and in 52 males. Coronary angiography (CA) was performed in all pts. *Results:* In Group 2 CA showed mCAD in 65, in Group 1 in 62 pts (p = ns). Sensitivity and specificity of the non invasive tests are shown in the table.

	DSE			STS			ET		
	f	m	p	f	m	p	f	m	p
sens, %	67	87	0.001	69	80	0.01	65	77	0.01
spec, %	72	98	0.001	60	93	0.001	58	90	0.001

sens = sensitivity, spec = specificity; f = females; m = males

Conclusion: In the male population DSE showed a greater sensitivity and specificity than the other tests ($p < 0.05$); however in the female group there was no test sensitive and specific enough for the diagnosis of mCAD. The true non invasive gold standard for the diagnosis of mCAD in women is once again fugitive.

966-73 Is Non-sustained Ventricular Tachycardia Associated With Ischemia During Stress Testing?

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There is evidence that stress-induced ischemia and ST segment depression are more likely in patients with exercise induced ventricular arrhythmias. To determine if NSVT (at least four consecutive premature ventricular depolarizations) during treadmill testing (ETT) in absence of other electrocardiographic (ECG) changes is associated with ischemia, we prospectively analyzed 388 patients who had ETT-Tc-99m-mibi testing. 102 patients had a negative ETT for ischemia. 26 had NSVT. 286 were excluded due to baseline ECG abnormalities, ischemic changes, or inadequate heart rate. Imaging studies were analyzed for ischemia.

Results:

Patients	n	Abnormal MIBI	Ischemia	Scar
NSVT	26	17	13	4
No NSVT	76	17	2	13

NSVT and ischemia were associated; Odd Ratio (OR): 37 (CI 7.5–187.5), $p < 0.0001$. NSVT was associated with abnormal perfusion OR: 6.56 (CI 2.48–17.32), $p < 0.0001$. NSVT did not have a significant association with scar. The absence of NSVT had a negative predictive value for ischemia of 97%. NSVT had a sensitivity of 87% and a specificity of 85% for detecting ischemia.

Conclusions: NSVT is associated with ischemia in the absence of ECG criteria for ischemia during ETT. The absence of NSVT during a negative ETT in a group with high prevalence of CAD has a good negative predictive value.

966-74 New Non-Invasive Protocol for Detection of Vasospastic Angina with Significant Organic Stenosis

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The purpose of this study was to compare the clinical usefulness of the new combined protocol, the treadmill exercise test staged up at 1-minute increments of Bruce protocol just after 5 minutes' hyperventilation (HV (5) + TM (1)) with those of only HV test (HV (5)) and only TM test using Bruce protocol (TM (3)) as a provocation test for diagnosing patients (pts) with vasospastic angina who had significant (> 75%) stenosis. We studied angiographicaly confirmed 17 pts (17 men, mean age of 63 years old) with typical rest angina who had fixed stenosis. All pts manifested coronary spasms by either acetylcholine (ACh) or ergonovine (ER) on significant stenotic lesions. ACh was performed in incremental doses of 20, 50 μg into the RCA and of 20, 50 and 100 μg into the LCA. ER was performed in total doses of 40 μg into the RCA and of 64 μg into the LCA. We defined spasm as positive with total or subtotal occlusion. Three tests were performed in the morning at from 9:00 am to 11:00 am for 3 days under no medication. Provocative test was defined as positive with ST-segment depression or elevation of more than 2 mm. The result was as follows:

	HV (5)	TM (3)	HV (5) + TM (1)
Chest symptoms (A)	6/17 (35%)	5/17 (29%)	16/17 (94%)#
Positive ECG changes (B)	3/17 (18%)	8/17 (47%)	16/17 (94%)#
(A) and/or (B)	6/17 (35%)	8/17 (47%)	16/17 (94%)#
ST elevation	3/17 (18%)	2/17 (12%)	10/17 (59%)*

#$p < 0.01$; *$p < 0.05$ vs HV (5) and TM (3)

In conclusion, We recommend this new combined protocol for detection of vasospastic angina who had significant organic stenosis.

966-75 Can sequential exercise testing distinguish ischemic heart disease from syndrome X?

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Reduced angina after 'warm-up' exercise is well described in ischemic heart disease (IHD). The aim of this study is to determine whether 'warm-up' occurs in Syndrome X (normal coronary arteries but ST segment depression on exercise, N) and whether the presence or absence of 'warm-up' on sequential treadmill exercise testing can distinguish patients with IHD from those with N. *Method:* 33 patients with IHD confirmed by angiography (> 70% diameter stenosis) and 20 patients with normal coronary arteries (N) were studied. All patients had > 1 mV ST depression on treadmill exercise. Each subject performed two equivalent treadmill tests separated by 10 minutes rest using a modification of the Bruce protocol with 1 minute increments in work. Electrocardiograms were later analysed blind to diagnosis and order. The difference in ST segment depression between first and second exercise was averaged for 3 leads at 3 equivalent exercise times. *Results:* Mean ST segment depression was less on second exercise in patients with IHD (1st–2nd = 0.031 mV, 95% CI 0.019, 0.043) but not in patients with N (−0.005 mV, CI −0.0197, 0.010; IHD vs N p = 0.008). Heart rate and rate-pressure product were similar on first and second exercise for both IHD and N. A mean decrease in ST segment depression on second exercise of > 0.013 mV had a sensitivity of 73% and a specificity of 75% for IHD. *Conclusion:* Patients with IHD have, on average, less ST segment depression on second exercise indicating a 'warm-up' response and those with normal coronary arteries do not. Sequential exercise testing may have some value in distinguishing IHD from N.

966-76 Comparison of Patients with Exercise Induced Angina Versus Those with Silent Ischemia During Exercise Testing

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To evaluate the magnitude of silent versus painful ischemia during exercise testing (Ex), we evaluated Ex-time (T, minutes), time to 1 mm ST ↓, heart rate and systolic blood pressure at 1 mm ST ↓, peak (Pk) heart rate and Pk systolic blood pressure responses, and maximum ST ↓ in mm, during treadmill exercise testing in 86 patients with stable angina and coronary artery disease. All patients had an ischemic response during the treadmill test using the Bruce protocol; Forty seven (Gr 1) patients developed painful ischemia and thirty nine (Gr 2) had painless ischemia during exercise testing.

Results: There was no significant difference between the groups in mean age, history of angina, prior MI, coronary risk factors, or q-waves on 12 lead ECG. Comparison of exercise test parameters (mean values) is shown:

	Ex-T	T-1 ST ↓	HR-ST ↓	BP-ST ↓	Pk HR	Pk BP	ST ↓ (mm)
Gr1	6.2	4.2	103	158	118*	163*	1.9
Gr2	6.7	4.4	109	162	128	176	1.7

* = $p < 0.05$ compared to Gr 2

The Ex duration, time to 1 mm ST ↓, HR and systolic BP at onset of ischemia, and maximum ST ↓ were similar between the groups. The patients with painful ischemia, however, achieved significantly lower peak HR and peak systolic BP during exercise testing.

Conclusions: The comparable exercise times and rate-pressure product at 1 mm ST ↓ and the extent of maximum ST ↓ in the two groups suggest a similar magnitude of exercise induced ischemia in patients with silent and those with painful ischemia during exercise testing. The lack of exercise induced angina should not be considered as a sign of less significant CAD.